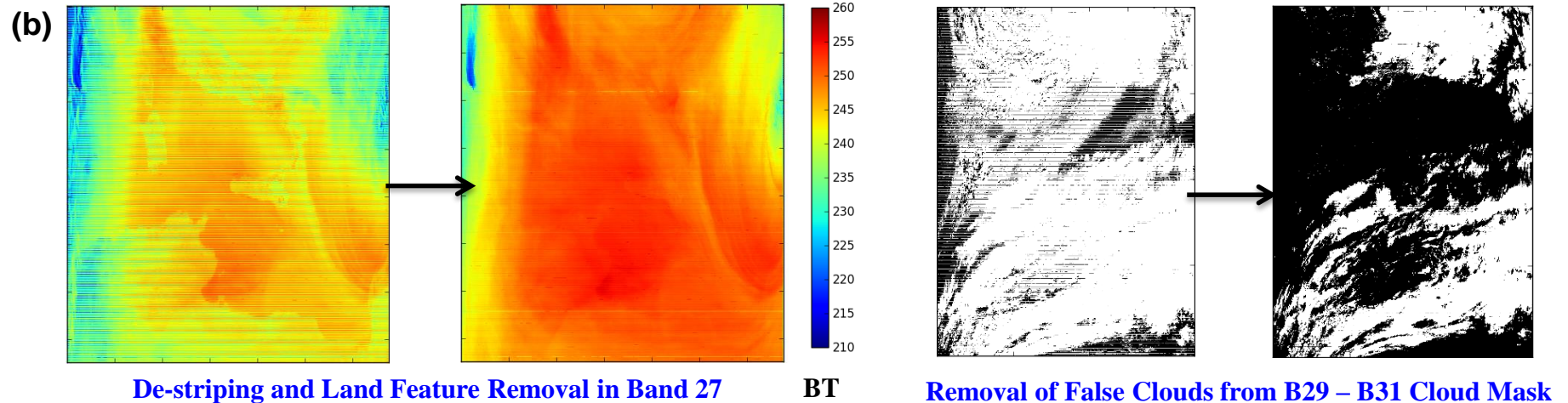
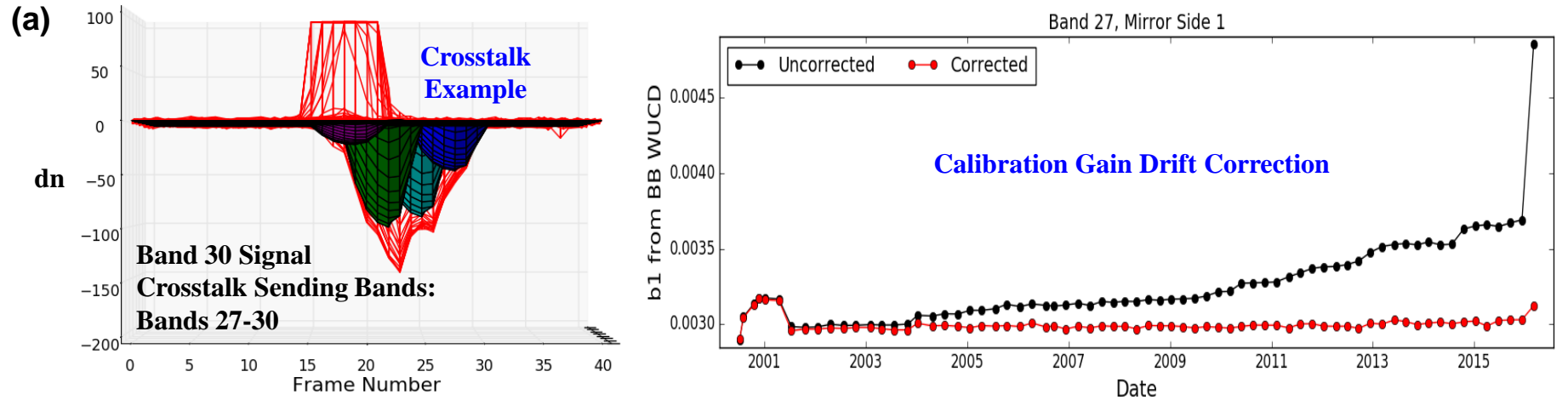




# Progress of Improving Terra MODIS LWIR Spectral Band Calibration

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Restoring Terra MODIS LWIR spectral band calibration and data quality using improved crosstalk correction algorithm and coefficients derived from on-orbit lunar observations.



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### References:

MCST Presentation at MODIS and VIIRS Calibration Workshop, MODIS and VIIRS Science Team Meeting June 6-10, 2016  
Sun, J., X. Xiong, Y. Li, S. Madhavan, A. Wu, and B. N. Wenny, "Evaluation of Radiometric Improvements With Electronic Crosstalk Correction for Terra MODIS Band 27," IEEE Transactions on Geoscience and Remote Sensing, vol. 52, issue 10, pp. 6497 - 6507, Oct 2014  
Xiong, X., Z. Wang, J. Sun, A. Angal, J. Fulbright, and J. Butler, "MODIS and VIIRS lunar observations and applications," Proc. SPIE 8889, Sensors, Systems, and Next-Generation Satellites XVII, 88890V, 2013

**Data Sources:** All sensor calibration raw data and the data used to generate the images and science product examples are from NASA GSFC Level 1 and Atmosphere Archive and Distribution System (LAADS). The calibration coefficients and crosstalk correction coefficients are derived by the NASA MODIS Characterization Support Team (MCST).

### Technical Description of Figures:

**Graphic a):** Terra MODIS LWIR spectral band crosstalk example for receiving band 30 and sending band from 27 to 30 (left). Illustration of band 27 calibration gain drift correction (right). The calibration gains (before and after correction) are computed using on-board blackbody observations.

**Graphic b):** Examples of de-stripping and land feature removal in Terra MODIS band 27 (data granule: 2015183.1005) and removal of false clouds from B29 – B31 Cloud Mask (data granule: 2015182.1345).

**Scientific significance, societal relevance, and relationships to future missions:** Terra MODIS has successfully operated for more than 16 years since its launch in December 1999 and its data products have been widely used by the remote sensing community and users worldwide for studies of many key environmental parameters of the earth's system. Electronic crosstalk in the LWIR PV bands (27-30) was initially identified pre-launch and its impact has become more server as mission continues to operate beyond its design lifetime. Correction algorithms have been developed and improved by previous and current MCST members to restore Terra MODIS LWIR spectral band calibration and data product quality. Implementation of crosstalk correction will be made after vigorous science and impact analyses. Approaches developed from MODIS crosstalk characterization and removal have potential applications for future remote sensing sensors, such as JPSS VIIRS and GOES-R ABI.